ELSEVIER

Journal of Magnetism and Magnetic Materials 203 (1999) xvi–xx

journal of magnetism and magnetic materials

www.elsevier.com/locate/jmmm

Contents

Preface xi

In memoriam xiii

A.J. Freeman, R. Wu, M. Kim and V.I. Gavrilenko
Magnetism, magneto-crystalline anisotropy, magnetostriction and MOKE at surfaces and interfaces (*Invited paper*) 1

P. Marín, M. Vázquez, J. Arcas and A. Hernando
Thermal dependence of magnetic properties in nanocrystalline FeSiBCuNb wires and microwires (*Invited paper*) 6

H. Kronmüller, R. Fischer, M. Bachmann and T. Leineweber
Magnetization processes in small particles and nanocrystalline materials (*Invited paper*) 12

J.M. González, O.A. Chubykalo and R.S. Rueda
A micromagnetic approach, based on the Monte Carlo algorithm, to the thermally activated magnetization reversal processes (*Invited paper*) 18

J.L. Dormann, D. Fiorani, R. Cherkaoui, E. Tronc, F. Lucari, F. D'Orazio, L. Spinu, M. Noguès, H. Kachkachi and J.P. Jolivet
From pure superparamagnetism to glass collective state in γ-Fe_2O_3 nanoparticle assemblies (*Invited paper*) 23

J. Fidler and T. Schrefl
Micromagnetic modelling of nanocrystalline magnets and structures (*Invited paper*) 28

A. Aharoni
Critique on the numerical micromagnetics of nanoparticles (*Invited paper*) 33

G. Pourroy, N. Viart and S. Läkamp
Magnetic characterization of composites Fe–Co alloy/Co containing magnetite (*Invited paper*) 37

D.R. Cornejo and F.P. Missell
Application of the Preisach model to nanocrystalline magnets (*Invited paper*) 41

D.P.E. Dickson
Nanostructured magnetism in living systems (*Invited paper*) 46

M. Blanco-Mantecón and K. O'Grady
Grain size and blocking distributions in fine particle iron oxide nanoparticles 50

E.H.C.P. Sinnecker, D. Páramo, V. Larin, A. Zhukov, M. Vázquez, A. Hernando and J. González
Glass coated microwires with enhanced coercivity 54

M. Pardavi-Horvath
Characterization of nanostructured magnetic materials 57

V. Franco, C.F. Conde and A. Conde
Magnetic properties and nanocrystallization of a $Fe_{63.5}Cr_{10}Si_{13.5}B_9Cu_1Nb_3$ alloy 60

D. Prodan, C. Chanéac, E. Tronc, J.P. Jolivet, R. Cherkaour, A. Ezzir, M. Noguès and J.L. Dormann
Adsorption phenomena and magnetic properties of γ-Fe_2O_3 nanoparticles 63

M.T. Clavaguera-Mora and N. Clavaguera
Nucleation and growth of $Nd_2Fe_{14}B$ crystals from rapidly quenched amorphous alloys: a kinetic study 66

J.H.P. Watson, D.C. Ellwood, A.K. Soper and J. Charnock
Nanosized strongly-magnetic bacterially-produced iron sulfide materials 69

D. Schmool, A. García-Arribas, E. Abad, J.S. Garitaonandia, M.L. Fdez-Gubieda and J.M. Barandiarán
Magnetic and structural changes in $Cu_{90}Co_{10}$ during the annealing process 73

P. Allia, P. Tiberto and F. Vinai
High-temperature superparamagnetic behaviour of $Cu_{100-x}Co_x$ systems containing Co particles in the nanometer range 76

0304-8853/99/$ - see front matter © 1999 Elsevier Science B.V. All rights reserved.

L. Pascual, C. Gómez-Polo, P. Marín, M. Vázquez and H.A. Davies
Magnetic hardening in nanocrystalline FeCoSiB-CuNb alloy 79

D. Holzer, I. Pérez de Albéniz, R. Grössinger and H. Sassik
Low temperature properties of nanocrystalline $Fe_{73.5}Cu_1Nb_3Si_{13.5}B_9$ ribbons 82

M. Frost, I. Todd, H.A. Davies, M.R.J. Gibbs and R.V. Major
Evolution of structure and magnetic properties with annealing temperature in novel Al-containing alloys based on Finemet 85

A. Hucht and K.D. Usadel
Theory of the spin reorientation transition of ultra thin ferromagnetic films 88

B. Kawecka-Magiera, M. Magdoń, A.Z. Maksymowicz, T. Sitkowski, G.R. Aranda, J. Gonzalez and K. Kulakowski
Ising model of a nanocrystalline system – effect of annealing 91

J.-H. Hsu and Y.-H. Huang
Tunneling magnetoresistance effect in Fe–Pb–O and Fe–PbO granular films: a comparison 94

S. Rubin, M. Holdenried and H. Micklitz
A model system for the GMR in granular systems: well-defined Co clusters embedded in an Ag matrix 97

M. Respaud, B. Martínez, Ll. Balcells, J. Fontcuberta, X. Obradors, J.M. Broto, H. Rakota and M. Goiran
Magnetic surface anisotropy and magnetoresistance in polycrystalline manganese perovskites 100

E. Rozenberg, A.I. Shames, G. Gorodetsky, J. Pelleg and I. Felner
Magnetic and magnetoresistive properties of nanostructured Au–NiFe films 102

S. Sanvito, C.J. Lambert and J.H. Jefferson
Systematic study of ballistic GMR in magnetic multilayers through the 3d, 4d, and 5d transition metals 105

N.A. Usov, A.S. Antonov, A.N. Lagar'kov and A.B. Granovsky
GMI spectra of amorphous wires with different types of magnetic anisotropy in the core and the shell regions 108

D. Ménard, M. Britel, P. Ciureanu, A. Yelon, M. Rouabhi and R.W. Cochrane
Investigation of the damping parameter in soft magnetic wires using the giant magnetoimpedance effect 111

M. Tejedor, B. Hernando, M.L. Sánchez and V.M. Prida
Magnetic field and low frequency dependence of impedance reactive component in nanocrystalline $Fe_{73.5}Cu_1Nb_3Si_{16.5}B_6$ ribbons 114

J.A. Moya, B. Arcondo, H. Sirkin, M.L. Sartorelli, M. Knobel and M. Vázquez
GMI of Al-substituted Fe–Si–B–Cu–Nb nanocrystalline ribbons 117

X. Batlle, C. Echer, K.M. Krishnan, B.J. Hattink and A. Labarta
Structural and magnetic properties of iron particles in a copper matrix 120

B. Dacuña, J. Mira, M.C. Blanco, M.A. López-Quintela and J. Rivas
Preparation of CoAg electrodeposited films 123

J.E. Ortega, A. Närmann, K.N. Altmann, W. O'Brien, D.J. Seo, F.J. Himpsel, P. Segovia, A. Mascaraque and E.G. Michel
Short wavelength, spin-polarized quantum-well states in high quality Cu films on FCC-Co(1 0 0) 126

X. Amils, J. Nogués, S. Suriñach and M.D. Baró
Magnetic investigations on the disordering of a ball milled Fe–40 Al at% alloy 129

H. Jaffrès, L. Ressier, F. Michelini, D. Chandesris, P. Le Fèvre, H. Magnan, J.L. Gauffier, R. Mamy, M. Goiran, J.P. Peyrade, J.F. Bobo, J.C. Ousset, J.P. Redoulès, D. Bertrand and A.R. Fert
Anisotropy in metallic thin films patterned by the atomic saw method 132

V. Šepelák, S. Wißmann and K.D. Becker
Magnetism of nanostructured mechanically activated and mechanosynthesized spinel ferrites 135

M. Ellouze, J.C. Joubert and Ph. l'Héritier
Synthesis of soft ferromagnetic nanocomposites by controlled nitrogen diffusion-segregation in $Y_2Fe_{16}Ti$ 138

G.F. Goya and H.R. Rechenberg
Magnetic properties of $ZnFe_2O_4$ synthesized by ball milling 141

R. Pizarro, J.M. Barandiarán, F. Plazaola and J. Gutierrez
Synthesis and characterisation of amorphous $Fe_{75}Zr_{25}$ obtained by ball milling 143

M.P. Morales, M. Andres-Vergés, S. Veintemillas-Verdaguer, M.I. Montero and C.J. Serna
Structural effects on the magnetic properties of γ-Fe_2O_3 nanoparticles 146

V.P. Menushenkov, A.S. Lileev, M.A. Oreshkin and S.A. Zhuravlev
Metastable nanocrystalline A_1 phase and coercivity in Fe–Nd alloys 149

H. Chiriac, M. Marinescu, K.H.J. Buschow, F.R. de Boer and E. Bruck
Nanocrystalline $Nd_8Fe_{77}Co_5CuNb_3B_6$ melt-spun ribbons 153

J.I. Martín, J.L. Vicent, J.V. Anguita and F. Briones
Fabrication of ordered arrays of permalloy submicrometric dots 156

H. Chiriac, A.E. Moga, M. Urse and F. Necula
Formation and magnetic properties of mechanically alloyed Fe–Cu–Nb–Zr–B nanocrystalline powders 159

A. Cebollada, P. Caro, J.L. Menéndez, F. Briones, D. García, A. Hernando and J.A. García Díaz
Structure and magnetic anisotropies of epitaxial FePd (0 0 1) and (1 1 0) alloys 162

N. Murillo, J. González, C. Guraya, M. Gutiérrez and F.J. Seco
Structural and magnetic properties of sintered Sr-ferrites fabricated by powder injection molding 165

G.E. Abrosimova, A.S. Aronin, E.Yu. Ignat'eva and V.V. Molokanov
Phase decomposition and nanocrystallization in amorphous $Ni_{70}Mo_{10}P_{20}$ alloy 169

S. Grognet, H. Atmani, J.M. Le Breton, R. Zuberek, C. Iacob and J. Teillet
The influence of nitrogen on the structural and magnetic properties of nanocrystallized Finemet-type ribbons 172

C. de Julián, G.A. Pérez Alcázar, F. Cebollada, M.I. Montero, J.M. González and J.F. Marco
Mössbauer analysis of the phase distribution present in nanoparticulate Fe/SiO_2 samples 175

G.F. Korznikova, Kh.Ya Mulyukov, I.Z. Sharipov and L.A. Syutina
Structure peculiarities and magnetic properties of submicrocrystalline terbium 178

T.P. Krinitsina, E.A. Kravtsov, V.V. Lauter-Passiouk, H.J. Lauter, V.V. Popov, L.N. Romashev, V.A. Tsurin, A.M. Burkhanov and V.V. Ustinov
Morphology of crystallites and magnetic structure of non-collinear Fe/Cr multilayers 181

C. Lemoine, A. Fnidiki, D. Lemarchand and J. Teillet
Mössbauer and TEM study of Fe–Cr powders elaborated by mechanical alloying 184

A. Ślawska-Waniewska, J.M. Greneche, A. Roig and A. Inoue
Mössbauer investigations of $Fe_{87}Zr_7Si_4B_2$ nanocrystalline alloys 187

N. Ševulová, A. Buchal, P. Petrovič, K. Tkáčová and V. Šepelák
Structural investigation of the high-energy milled Fe–Si system 190

Y.G. Yoo, D.S. Yang, S.C. Yu, W.T. Kim and J.M. Lee
Structural and magnetic properties of mechanically alloyed $Co_{20}Cu_{80}$ solid solution 193

E. Agostinelli, D. Fiorani and A.M. Testa
Structural and magnetic properties of PLD Co–Ag granular thin films 196

R. Houssa, V. Franco and A. Conde
Microstructure and magnetic properties of a FeSiB–CuNb alloy submitted to Joule heating 199

C. Morón, A. García and M. Mora
Theoretical model of the deformation induced by local heat treatments in amorphous ribbons 202

M.I. Montero, M. Emura, F. Cebollada, J.M. González, E.M. González and J.L. Vicent
Coercivity analysis in the $Co_x/(SiO_2)_{100-x}$ nanoparticulate system 205

D. García, G.V. Kurlyandskaya, M. Vázquez, F.I. Toth and L.K. Varga
Influence of field annealing on the hysteretic behaviour of the giant magneto-impedance effect of Cu wires covered with $Ni_{80}Fe_{20}$ outer shells 208

P. García-Tello, N. Murillo, J. González, E. Amano, R. Valenzuela and J.M. González
The effective anisotropy of nanocrystallized Co-based alloys 211

M.F. Hansen and S. Mørup
Estimation of blocking temperatures from ZFC/FC curves 214

C.G. Kim, H.C. Kim, S.S. Yoon, D.G. Park and J.H. Hong
Effect of proton irradiation on magnetic relaxation in amorphous material 217

V. Soyka and L. Kraus
Magnetic properties of stress/field annealed nanocrystalline FeCoNbB alloys 220

A. Hernando, E. Navarro, A.R. Yavari, D. Fiorani and M. Rosenberg
Magnetic properties of disordered grain boundaries in nanocrystalline FeRh alloys 223

I. Škorvánek, J. Kováč, J. Marcin, P. Duhaj and R. Gerling
Annealing effects on the magnetic properties of nanocrystalline FeNbB alloys 226

K. Suzuki and J.M. Cadogan
Role of the residual amorphous phase in the intergranular magnetic coupling in nanocrystalline magnetic alloys 229

A.V. Torcunov, S.A. Baranov, V.S. Larin and V.F. Bashev
The magnetic properties of CoMnBSi composition microwires in amorphous and nanocrystalline state 231

M. Vélez, M.C. Cyrille, S. Kim, I.K. Schuller and J.L. Vicent
Influence of magnetic order in the superconducting properties of Nb/Fe/Cu multilayers 233

S.S. Yoon, C.G. Kim and H.C. Kim
The mechanism of magnetic relaxation in Co-based amorphous ribbon determined by permeability spectroscopy 235

A. Zhukov, A.F. Cobeño, J. Gonzalez, A. Torcunov, E. Pina, M.J. Prieto, J.M. Blanco, V. Larin and S. Baranov
Ferromagnetic resonance, magnetic behaviour and structure of Fe-based glass-coated microwires 238

E. Gan'shina, R. Kumaritova, A. Bogoroditsky, M. Kuzmichov and S. Ohnuma
Magneto-optical spectra of insulating granular system Co–Al–O 241

E. Gan'shina, V. Guschin, S. Kirov, O. Shabanova and A. Tselev
Magnetooptical properties of alloy films Co–Pd with perpendicular magnetic anisotropy 244

Y.S. Didosyan, H. Hauser, J. Nicolics and I.R. Yavorsky
Light diffraction by a single domain wall 247

E.E. Shalyguina, N.I. Tsidaeva, I.A. Pogrebnaya, O.A. Shalyguina, A. Marty and B. Gilles
Magneto-optical investigation of Au/Cu-wedge/NiFe sandwiches 250

F. Rivadulla, L.E. Hueso, J. Rivas, M.C. Blanco, M.A. López-Quintela and R.D. Sánchez
Effects of electrochemical reduction on the magnetotransport properties of $La_{0.67}Ca_{0.33}MnO_{3\pm\delta}$ nanoparticles 253

V. Trtik, F. Sánchez, M. Varela, M. Bibes, B. Martínez and J. Fontcuberta
Magnetic and transport properties of $La_{2/3}Sr_{1/3}MnO_3$ thin films prepared by pulsed laser deposition 256

A.I. Shames, E. Rozenberg, G. Gorodetsky, B. Revzin, D. Mogilyanski, J. Pelleg and I. Felner
Experimental ESR studies of nano-size magnetic heterogeneities in polycrystalline $La_{0.5}Pb_{0.5}MnO_3$ and $La_{1.34}Sn_{0.66}Mn_2O_7$ 259

T. Szumiata, R. Żuberek, J. Gonzalez, A. Ślawska-Waniewska and H. Szymczak
Model of surface magnetostriction in nanostructured materials 262

P.J. Cregg and L. Bessais
A single integral expression for the magnetisation of a textured superparamagnetic system 265

J. García-Otero, M. Porto, J. Rivas and A. Bunde
Monte Carlo simulation of hysteresis loops of single-domain particles with cubic anisotropy and their temperature dependence 268

G. Kamieniarz, R. Matysiak, W. Florek and S. Wałcerz
Characterization of some mesoscopic rings: simulation techniques 271

G.R. Aranda, J. González, O.A. Chubykalo and J.M. González
Transverse biased initial susceptibility in amorphous ultra-thin films: a micromagnetic simulation 274

N.A. Usov
Magnetization curling in soft type ferromagnetic particles with large aspect ratios 277

V.M. Uzdin and N.S. Yartseva
Fe/Cr interface magnetism in the external magnetic field 280

V.M. Uzdin, N.S. Yartseva and L. Adamowicz
Phase shift of exchange coupling oscilations in magnetic multilayers 283

G. Mukhopadhyay, P. Apell and M. Hanson
Study of planar lattice of magnetic particles 286

M. Maicas, M.A. Rivero, E. López, M.C. Sánchez, C. Aroca and P. Sánchez
Domain-wall magnetostatic coupling in permalloy/Cu sandwiches 289

P. Aragoneses, D. Holzer, H. Sassik, A. Zhukov, R. Grössinger and J. Gonzalez
Frequency dependence of GMI effect in nanocrystalline $Fe_{86}Zr_7B_6Cu_1$ ribbons 292

V.O. Vas'kovskiy, A.V. Svalov, M. Vázquez, A. Hernando, G.V. Kurlyandskaya, D. García and A.V. Gorbunov
Magnetic anisotropy peculiarities of Gd/Co films near the magnetic compensation state 295

D. Ramin and W. Riehemann
Power losses of Finemet using nonsinusoidal waveforms 298

S.S. Yoon, C.G. Kim, H.C. Kim, K.J. Jang and K.S. Ryu
Analysis of giant magneto-impedance in terms of anisotropy field in annealed amorphous $Co_{66}Fe_4NiB_{14}Si_{15}$ ribbons 301

H. Fukunaga, S. Hayashida, Y. Kanai and F. Yamashita
Flux stability in nanocomposite magnets 304

A. García, C. Morón and M. Mora
Theoretical calculation for uniaxial anisotropies detection by using rotating magnetic fields 307

A.Yu. Toporov, M.R. Kiselev, S.D. Kaloshkin, V.V. Tcherdyntsev and I.A. Tomilin
Changes of magnetic properties of $Fe_{50}Mn_{50}$ composition at mechanical alloying 310

Yu.V. Baldokhin, V.V. Tcherdyntsev, S.D. Kaloshkin, G.A. Kochetov and Yu.A. Pustov
Transformations and fine magnetic structure of mechanically alloyed Fe–Ni alloys 313

S.C. Yu, Y.Y. Song, L.F. Kiss and I. Vincze
Study on the magnetic behavior of nanogranular $Cu_{80}Fe_{10}Co_{10}$ solid solution 316

D. Arcos, R. Valenzuela, M. Vázquez and M. Vallet-Regí
Frequency behaviour of Zn–Mn ferrites nanoparticles obtained by high-energy ball milling 319

Author index 322

Subject index 328